each individual Braille cell, or a tactile member cover **110** adapted for use with a plurality of Braille cells may be employed. When the Braille dot **75** is in the rest position, the bottom surface of the Braille cell is in contact with the top surface of the housing and the top surface of the Braille cell is flush with the top inner surface of the tactile member cover. FIG. **6**(*a*) illustrates a Braille dot in the rest position, being flush with the tactile member cover, and therefore inpalpable. FIG. **6**(*b*) illustrates a Braille dot **75** in the palpable position, with the dot raised above the tactile member cover **110**.

In conclusion, a novel self supporting and hydraulic (SSH) system is invented in making the compact Braille cell which can provide over 30 grams supporting force, 0.7 mm displacement for the Braille dot and less than 100 ms response time simultaneously. Using this novel Braille cell a full page Braille display which will demonstrate both Braille character and graphic information can be fabricated. The power consumptions is very low. The new Braille cell is made based on the electroactive polymer technology. Therefore, the fabrication process will be highly integrated. The cost for making Braille cell will be lowered dramatically. The new Braille cell is so compact it will be used in a variety places.

It will be seen that the advantages set forth above, and those made apparent from the foregoing description, are efficiently attained and since certain changes may be made in the above construction without departing from the scope of the invention, it is intended that all matters contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween. Now that the invention has been described,

What is claimed is:

1. A Braille cell comprising:

a substantially fluid-tight housing having a top end and a bottom end;

an opening in the top end of the housing, the opening fluidly sealed with a flexible diaphragm, the flexible diaphragm having a topside and an underside;

at least two support blocks positioned at the bottom end of the housing;

a stabilizer block positioned at the bottom end of the housing and positioned between the at least two support blocks;

an actuator rod having a top end and a bottom end, the top end of the actuator rod secured to the underside of the flexible diaphragm and the bottom end of the rod secured to the stabilizer block; and

at least two electroactive polymer bending elements, each element having a top edge and a bottom edge, the bottom edge of each of the electroactive polymer bending elements secured to one of the at least two support blocks, the top edge of each of the electroactive polymer bending elements secured to the housing.

2. The Braille cell of claim **1**, wherein the housing further comprises:

two substantially continuous sides; and

two windowed sides, the windowed sides further comprising a support strip positioned to establish a top aperture and a bottom aperture.

3. The Braille cell of claim **2**, wherein the two continuous sides are positioned opposite each other and the two windowed sides are positioned opposite each other in the housing.

4. The Braille cell of claim **2**, further comprising, four electroactive polymer bending elements, each of the four electroactive polymer bending elements positioned to cover one of each of the top aperture and the bottom aperture of the two windowed sides, wherein one edge of each bending element is secured to the support strip.

5. The Braille cell of claim **1**, wherein the housing is substantially rectangular.

6. The Braille cell of claim **1**, wherein the housing is filled with a fluid.

7. The Braille cell of claim **6**, wherein the fluid is a liquid.

8. The Braille cell of claim **6**, wherein the fluid is a gas.

9. The Braille cell of claim **1**, wherein the at least two electroactive polymer bending elements are substantially rectangular.

10. The Braille cell of claim **1**, wherein the at least two electroactive polymer bending elements are substantially of equal dimension.

11. The Braille cell of claim **1**, wherein the electroactive polymer bending element further comprises, an electroactive polymer layer secured to a substantially rigid layer.

12. The Braille cell of claim **11**, wherein the electroactive polymer layer comprises an electronic electroactive polymer.

13. The Braille cell of claim **12**, wherein the electronic electroactive polymer is a poly vinylidene fluoride, PVDF.

14. The Braille cell of claim **11**, wherein the electroactive polymer layer comprises an ionic electroactive polymer.

15. The Braille cell of claim **14**, wherein the ionic electroactive polymer is an ionomeric polymer-metal composite.

16. The Braille cell of claim **11**, wherein the electroactive polymer layer further comprises:

a plurality of photo lithographed microelectrodes, the microelectrodes placed in alternating fashion having a common positive bus and a common negative bus.

17. The Braille cell of claim **1**, further comprising a switchable power supply in circuit communication with the electroactive polymer bending element, the switchable power supply to deliver a voltage to the electroactive polymer bending element sufficient to result in bending of the electroactive polymer bending element.

18. The Braille cell of claim **1**, further comprising a Braille dot positioned on the topside of the flexible diaphragm.

19. A Braille cell comprising:

a substantially fluid-tight housing having a top end, a bottom end, two facing substantially solid sides and two facing windowed sides, wherein the two facing windowed sides further comprises a support strip positioned to establish a top aperture and a bottom aperture;

an opening in the top end of the housing, the opening fluidly sealed with a flexible diaphragm, the flexible diaphragm having a topside and an underside;

two support blocks positioned at the bottom end of the housing;

a stabilizer block positioned at the bottom end of the housing and positioned between the two support blocks;

an actuator rod having a top end and a bottom end, the top end of the actuator rod secured to the underside of the flexible diaphragm and the bottom end of the rod secured to the stabilizer block;